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(56) Documents cited

GB 2201125 A US 4924075 A US 4814591 A  
US 4806745 A US 4697072 A US 4614861 A  
US 4394654 A

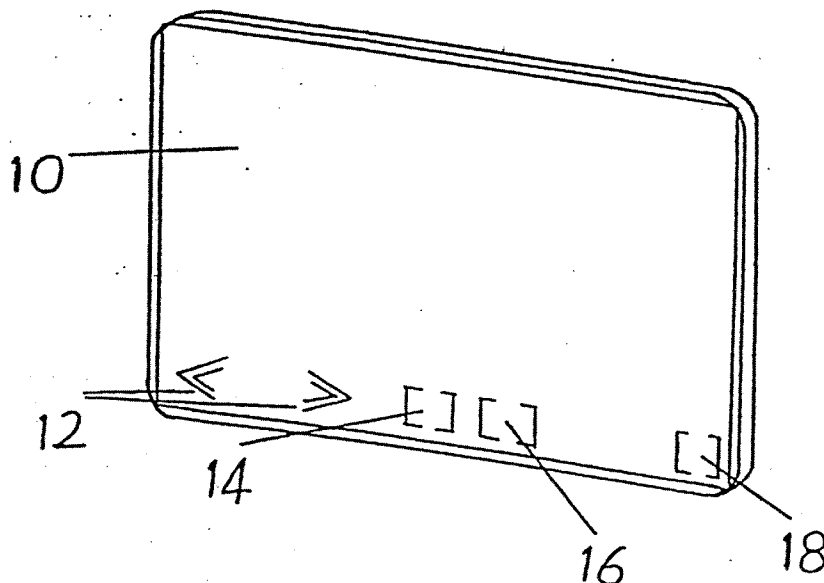
(58) Field of search

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(54) Integrated circuit card with display

(57) A credit or bank card including an integrated circuit incorporates a liquid crystal display screen that covers one side of the card. The screen has a touch sensitive surface (12-18) enabling data input and/or retrieval using a cursor. A signature, photograph or description of the card holder can be displayed on the screen to provide validation of the card user. Interaction of the card with a reader can be through a magnetic strip on the other side of the card or by means of the integrated circuit.

FIG 1



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FIG 1

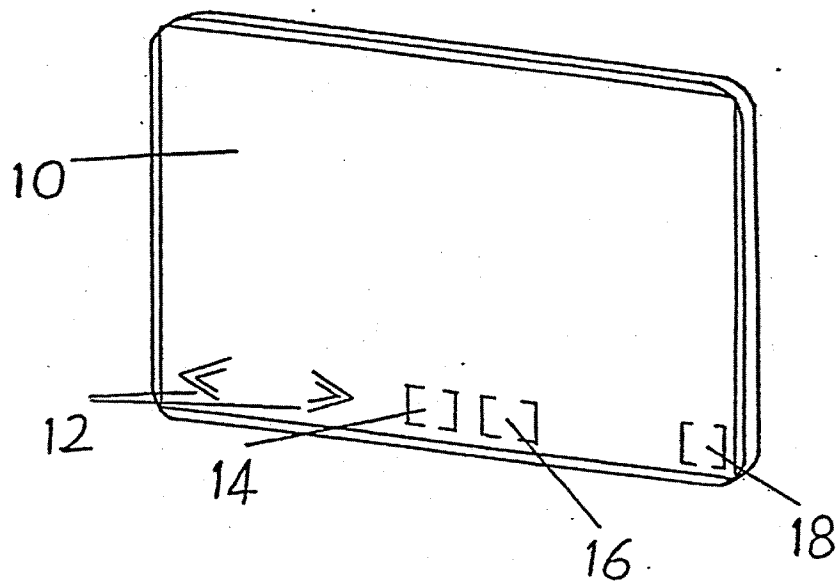
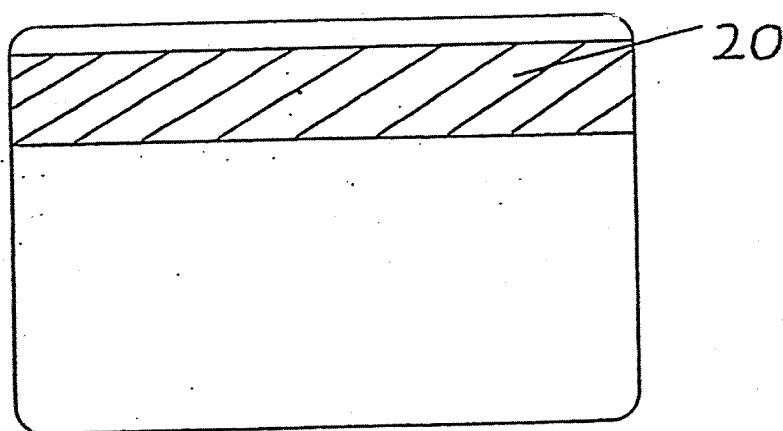


FIG 2



CREDIT/BANK CARD SECURITY SYSTEM

This invention relates to a security system comprising a token, of any shape or construction or material(s), comprising integrated circuitry having storage means holding a personalised identification code sequence and further digitised information. The token also comprises a means for inputting such personalised identification code sequence thereby enabling access to such further digitised information and includes a means for displaying such further information, preferably a liquid crystal display screen or screen of any type, incorporating a touch sensitive surface enabling data input and/or data retrieval.

The integrated circuitry within the body of the token also has means to read and/or write to a reader of any description/type.

Reference herein to any "electronic component" should be understood to include magnetic strips, ROM and RAM facilities, incorporated within the system.

The integrated circuitry, hereinafter called for simplicity, "IC", which is incorporated within the body of the token, can be constructed of any material and can include any type of electronic component, or component of any material.

Reference herein to the "screen" which is incorporated within the body of the token should be understood as meaning a "liquid crystal display" screen or screen of any type and/or of any construction or material(s), preferably incorporating a touch sensitive surface, enabling data input and/or data retrieval.

Reference herein to a "business" or "businesses" should be understood to include all points of sale of goods or services or of any provision of cash or access, eg. from national or international banks, individual stores, shops or groups of stores or shops, travel companies, etc.

Reference to "cash/charge card" or "card(s)" should be understood as meaning the "token", which is constructed of any material(s), and which means all "cards" providing cash, goods, services or credit from a business in modern everyday life; and which also includes areas which are restricted for security or other reasons.

1. Cash/charge cards, and their use, are well known. They comprise a plastic card with a magnetic strip on one side. Included on this strip is data relevant to that card and can include a conventional personal identification number and a facility for electronic direct debiting from the relevant account.

The authorised cardholder's name and account number are also printed or embossed on the card, with an area provided for the signature of the authorised cardholder.

2. These cards are used by the authorised cardholder to obtain money, goods or services. In obtaining money, a PIN can be used which is encoded in the magnetic strip.
3. Over the years, these cards have been subject to various means of fraud, arising from either the loss or theft of the card.

If the card is lost or stolen, the authorised cardholder is sometimes unaware of the fact and subsequently there is a delay in the holder notifying the relevant organisation that the card is no longer in their possession.

On occasions, the conventional PIN is obtained by the unauthorised card user with subsequent fraud taking place.

This illustrates the vulnerability of the card to unauthorised use, as there is no way of ascertaining immediate positive confirmation of identity for the business accepting the card.

Subsequently there is little or no protection for the issuing company, the authorised card holder and the business providing the goods or services.

To correct the problem of fraudulent use of such cards it has been proposed that the use of cards, containing electronic circuitry and/or having ROM and/or RAM facilities be employed. These cards are otherwise known as "smartcards". However using such cards usually requires the use of a reader of some type to operate in conjunction with the card.

The level of protection required for systems such as these would require any individual company to consider not only the cost of the smartcards and reader equipment, but also the maintenance of such equipment.

What is needed is a token that operates within the existing system as conventional cards do so now, with the additional benefit of being able to confirm the identity of the card user with or without a reader, preferably without. Thus offering flexibility, otherwise unknown to date.

4. According to this invention, there is provided the following in combination:

- a) A token of any shape, construction or material, preferably in the form of a plastic card (as described at 1, but with no signature panel, name or account details, etc.) having a means of data input/retrieval and incorporating an IC, hidden within the body of the plastic card, having storage means, in which a unique personalised code is encoded. The code should preferably comprise any number of letters and/or numbers, from four to a maximum of six characters. This unique code is chosen by and known only to the authorised card holder and the card issuing company.

The IC incorporated within the card is for the effective control and operation of the screen and has means to read and/or write to a reader of any description/type. Both the IC and the magnetic strip will also contain one or more of the following in any combination and can include data currently present on magnetic strip cards now in use:

- i) Data relevant to the card issuing authority.

- ii) Data relevant to enable or assist in authorisation of sale of goods or services.
- iii) Data relating to a unique personalised identification code known only to the cardholder.
- iv) Data confirming details of/or already on the card.
- v) Data confirming any other information unique to the cardholder which the cardholder wishes to include, which is to be viewed.
- vi) Data confirming details of cardholder eg. a description, photograph or signature of the cardholder, which is to be viewed.
- vii) Any other data to be viewed or not viewed, applicable at the time.

The preferred method of encoding the data described at 4a) (i-vii) is by digital processes, which are well known to the electronics industry, although any other method or process can be used for encoding of such data, and;

- b) A screen enabling information to be viewed from it, preferably incorporated on one side of the card, having a touch sensitive surface enabling an on/off data input and retrieval facility.

Any number of safety features can be included in the system eg. encoding and protecting information by various digital processes, emergency cancellation button, cancelling any information on the screen, etc.

- c) A unique personalised code, as described at 4a) chosen by and known only to the authorised cardholder. This is done so that an individual will remember one access code ONLY, however many cards that individual holds from different card issuing companies, as each different card can be programmed with the same access code.

Therefore, in conjunction with the appearance of the card (as described at 1 above, but with no signature panel or details etc.) the IC is hidden within the body of the plastic card, containing data relevant to that card and cardholder. The screen is also incorporated in one side of the card which will show data when activated. The plastic card can be constructed with on-board power supply of any means for solo operation eg. battery or with either contacts for the power and/or data access supplies or be contactless should it be necessary for the card to be operated in conjunction with a reader of any description/type.



A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawing in which:

Figure 1 shows in perspective the token in the form of a plastic card with a screen incorporating a touch sensitive surface.

Figure 2 illustrates the magnetic strip on the reverse side of the plastic card.

Referring to the drawing the token can be preferably constructed in the form of a plastic card, as shown in Figure 1, (and as described at 1) but with no signature panel, name or account details, etc. printed or embossed on the card.

The plastic card comprises a magnetic strip on one side, as shown in Figure 2 and means for data input and/or retrieval, a screen [10] on which to view data etc., an integrated circuit (not shown) for the effective control and operation of the screen with means to read and/or write to a reader of any description/type and having storage means which will also include data currently present on magnetic strip cards now in use, as already described at 4a) i-vii).

The screen will preferably have a touch sensitive surface to enable data input/retrieval with on/off facility [12] [14] [16] [18].

The authorised cardholder activates the card by touching a multi-function sensitive area [18] of the screen [10]. The cardholder can now select their personal identification code by activating [12].

When touched in turn, the arrows move a cursor over an alpha-numeric scale in the direction they indicate. On selection of each letter or number, it is entered into the system by activating [18] before proceeding to the next character.

On entering the last character of the PIC, the system automatically enters the confirmation mode which confirms that the PIC has been inputted correctly.

In this mode the data shown on the screen [10] can be:

1. Data relevant to the card issuing authority eg.  
name of issuing authority and/or logo etc.  
and/or any other data applicable at the time.
2. Data confirming details of/already on the card  
eg. name and/or account number of the authorised  
cardholder and/or any other data applicable at  
the time.

Safety systems concerning entry of the PIC are included and if activated will shut down the operation of the card permanently or for any length of time. An emergency Off switch [14] can also be included.

The card is then handed to the business representative who then views the data on the screen [10] to confirm that the PIC has indeed been inputted correctly.

The representative then selects Reveal [16] to see data to further confirm the identity of the cardholder. The screen will then show data such as a signature, photograph or description of the cardholder or any other data unique to the authorised cardholder.

To complete the transaction either the magnetic strip [20] as shown in Figure 2 is put through conventional wipe-through reading equipment, which is used and well known by businesses in modern everyday life, or the IC within the card is utilised as it will also have a means to read and/or write to a reader of any description/type thereby allowing the card to be used as a cash/charge card.

The card is deactivated by touching the multi-function sensitive area [18] for a prescribed length of time.

A business can always safely assume that they are dealing with the authorised cardholder, even when dealing with telephone transactions. This is because to obtain any details from the card, the user will have to know the PIC.

Cash/credit vending machines etc. will operate as they do now using the magnetic strip [20] on the card as shown in Figure 2. However the IC within the card will be able to replace the magnetic strip function as changes in machine design occur within the industry.

Other embodiments of this invention may be devised without departing from the scope or spirit of the present invention.

CLAIMS

1. A token incorporating a screen substantially as described herein with reference to Figure 1 and integrated circuitry having storage means with means to read and/or write to a reader of any description/type the token having a means of data input/retrieval.
2. A token as claimed in Claim 1 comprising a screen incorporating a touch sensitive surface to facilitate the means for data input and/or retrieval.
3. A token as claimed in Claim 1 or Claim 2 wherein the integrated circuitry includes data currently present on magnetic strip cards now in use and is for the effective control and operation of the screen.
4. A token as claimed in Claim 2 or Claim 3 wherein the integrated circuitry includes data substantially as described herein with reference to 4a) i-vii).
5. A token as claimed in Claim 4 wherein the token is of any shape, construction or material.
6. A token as claimed in any preceding claim wherein no details of name of cardholder, account number, or card issuing authority, etc. are printed or embossed on the token.

7. A token as claimed in Claim 6 wherein the token is preferably in the form of a plastic card incorporating a magnetic strip.
8. A token substantially as described herein with reference to Figures 1 and 2 of the accompanying drawing.

Amendments to the claims  
have been filed as follows

1. A self-contained verification token capable of generating stored data independently of other external systems, comprising a screen, to enable data to be viewed, substantially covering the major proportion of one side of the token; the token incorporating integrated circuitry having storage means with means to read and/or write to a reader of any description/type; the token also having a means of data input/retrieval.
2. A token as claimed in Claim 1 comprising a screen incorporating a touch sensitive surface to facilitate the means for data input and/or retrieval.
3. A token as claimed in Claim 1 or Claim 2 wherein the integrated circuitry includes data currently present on magnetic strip cards now in use and is for the effective control and operation of the screen.
4. A token as claimed in Claim 2 or Claim 3 wherein the integrated circuitry includes data substantially as described herein with reference to 4a) i-vii).
5. A token as claimed in Claim 4 wherein the token is of any shape, construction or material.
6. A token as claimed in any preceding claim wherein no details of name of cardholder, account number, or card issuing authority, etc. are printed or embossed on the token.

7. A token as claimed in Claim 6 wherein the token is preferably in the form of a plastic card incorporating a magnetic strip.
8. A token substantially as described herein with reference to Figures 1 and 2 of the accompanying drawing.

Examiner's report to the Comptroller under  
Section 17 (The Search Report)

Application number

9206251.2

## Relevant Technical fields

(i) UK CI (Edition K ) B6A (AK)

(ii) Int CL (Edition 5 ) G06K

Search Examiner

G J W RUSSELL

## Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASES: WPI

Date of Search

14 APRIL 1992

Documents considered relevant following a search in respect of claims

1-8

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A	GB 2201125 A (DE LA RUE) - see page 2 lines 5-20 and figure 2	1
A	US 4924075 (TOSHIBA) - see column 2 lines 51-56 and figure 2	1
A	US 4814591 (TOSHIBA) - see column 2 lines 27-40 and figure 1	1
A	US 4806745 (SHARP) - see column 1 lines 5-67	1
A	US 4697072 (CASIO) - see column 2 lines 14-29	1
A	US 4614861 (INTELLICARD) - see figures 1 and 2 and column 15 line 33 - column 16 line 65	1
A	US 4394654 (PORST) - see figure 1 and column 3 lines 36-44	1



Category	Identity of document and relevant passages	Relevant to claim(s)

**Categories of documents**

**X:** Document indicating lack of novelty or of inventive step.

**Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.

**A:** Document indicating technological background and/or state of the art.

**P:** Document published on or after the declared priority date but before the filing date of the present application.

**E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.

**&:** Member of the same patent family, corresponding document.

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).